TECHNOLOGY

# How to harness the power of technology in the Paris climate deal and beyond?

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*In what ways might technology transfer arrangements be strengthened in the new planned climate deal to help ensure effective future climate action across the globe?*

There are high expectations for the Twenty-first Conference of the Parties (COP 21) of the UN Framework Convention on Climate Change (UNFCCC) to deliver a new climate regime to take effect from the end of the decade when the current Kyoto Protocol expires. The talks will be held this month in Paris, France and many observers hope the occasion will prove an important milestone in global efforts to combat climate change. Unlike the Kyoto Protocol with its emissions-cuts targets for a list of developed economies only, the Paris agreement will at minimum require all nations to put forward some mitigation effort, now expressed in parties' self-determined "intended nationally determined contributions" (INDCs).

The INDCs generally will give way to a wide range of measures and actions to address climate change. Chief among these is the large scale diffusion of climate technologies. The term "technology development and transfer" – shortened hereafter as "technology" – refers to the process of development, transfer, adaptation, and deployment of technologies to facilitate a climate-compatible technology transition. Technology transfer is rooted in Article 4.5 of the 1992 UNFCCC founding document. However, while there have been some efforts in this area, the topic has proved contentious over the years. An important milestone came in 2010 in Cancun, Mexico with the establishment of a "Technology Mechanism" (TM).

This article aims to explore ways to help strengthen climate technology development and transfer arrangements for the agreement that might emerge from the Paris meet and the implementation of any such deal. It concludes that ample feasible options exist to improve the TM, including in the field of research and development (R&D) cooperation, forming an expert body and a vision for a global network on climate technology capabilities, and providing a strong link between finance and technology in the UNFCCC. The article draws on a longer issue paper published by ICTSD. [*Editor's note, ICTSD is the publisher of BioRes*] A variety of party proposals have been made on technology for the new climate regime, some of which are reflected in the draft text forwarded to Paris, including options such as a global goal for technology development and transfer or addressing intellectual property rights (IPRs).

**Current technology arrangements**

The objective of the Technology Mechanism – the existing main UNFCCC body dedicated to technology-related climate efforts – is to facilitate the implementation of actions for achieving support for mitigation and adaptation; determine technology needs, based on national circumstances and priorities; and the acceleration of action consistent with international obligations, at different stages of the technology cycle, including R&D, demonstration, deployment, diffusion, and transfer of technology.

The TEC, as the TM's "policy arm," has a broad mandate that includes the facilitation of "collaboration on the development and transfer of technologies for mitigation and adaptation between governments, the private sector, non-profit organisations and academic and research communities." So far, the TEC's main activities have included a number of thematic dialogues, the production of policy briefs, and signalling priority areas to the COPs. The TEC's 20 members are elected by the COP and reflect a geographical

## INDCs

UNFCCC parties agreed in 2013 to each submit domestic climate action plans, dubbed "intended nationally determined contributions" (INDCs)," as the building blocks of the new universal climate regime. These should contain at minimum a mitigation component but many put forward to date also cover areas such as adaptation, finance, and technology.

representation, but are supposed to be technology experts, acting in their personal capacity and not on behalf of their countries.

The CTCN's core objective, meanwhile, is to "facilitate a network of national, regional, sectoral and international technology networks, organisations and initiatives" that, among other things, responds to requests made by developing countries through their National Designated Entities (NDEs). The focus of the CTCN is on coaching NDEs on submission of requests for one-off activities such as a specific technical assistance programme and responding to those requests. Current requests have been roughly equally distributed between adaptation and mitigation and cover various sectors. The vision of the CTCN in the long term is that it would help build global, regional, and national networks of relevant actors that can turn to each other for knowledge, training, experience, and capacity building in order to effectively harness climate technologies.

The UNFCCC has also overseen several rounds of Technology Needs Assessments (TNAs) that aim to identify and prioritise technology options. However, while the TNA process is intended to result in technology action plans, strategies, and programmes within countries, it is unclear whether these have seen much follow-up so far. The remainder of this article will outline, drawing on semi-structured interviews with technology experts and negotiators, apparent salient issues that provide a basis for further discussion on technology in the pending Paris deal.

**Differentiated perspectives on technology**

"Technology transfer" is defined by the 2000 Intergovernmental Panel on Climate Change (IPCC) Special Report on the issue as "a broad set of processes covering the flows of know-how, experience, and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs, and research/education institutions. It comprises the process of learning to understand, utilise, and replicate the technology, including the capacity to choose it, adapt it to local conditions, and integrate it with indigenous technologies."[1]

The interviewees interpret this reading of technology transfer to explicitly cover human capabilities and capacity, including capabilities for repair, maintenance, adaptation, localisation and innovation of the hardware, and the "orgware," such as the capability to inspect, manage and legislate new technology, that is being transferred. However, although all interviewees were clear about this they also indicated that others including many parties, fail to see technology transfer in the same way.

This implicit or perceived disagreement on what constitutes technology transfer seems to be particularly stark between those countries at the "receiving end" and those that are "sharers," most commonly, between "developing" and "developed" countries. For example, there is substantial research highlighting that the successful uptake of technologies requires a range of local capabilities, the expansion of which are therefore seen as an important issue by developing countries. The issue of local capabilities does not, however, necessarily receive the same level of attention by developed countries. This could be one of the more implicit manifestations of the persistent division between so-called developed and developing countries in the climate talks, often colloquially called "the firewall" in UNFCCC corridors, leading to very different views on what is a feasible and fair way forward in the technology discussions.

**Future focus**

Interestingly many of the interviews revealed broad agreement that cooperation on strengthening innovation capabilities in developing countries, through activities such as cooperative R&D, needs to become a prominent action item for the Technology Mechanism moving forward. Other areas of opportunity mentioned by some, but not all, of the interviewees included (voluntary) technology standards; strengthened networks; and a climate-friendly IPR regime. Overall, while the TM's mandate would not have to change to address these suggested areas, the TEC and CTCN would likely need to undertake greater initiative in order to find the relevant funding.

**Institutional functioning**
All the interviewees felt that the TM is a necessary and useful entity that needs continued acknowledgement in the Paris agreement. They almost unanimously felt, however, that more could and should be done for the TM to live up to its potential and expectations. The mandate is generally thought to be broad and extensive enough but the current form and level of implementation, and in particular the funding situation, is seen as insufficient.

A part of the explanation might be that the TM is still relatively young, notably, the CTCN only truly started operations in early 2014. Expectations that it would be able to fulfil its mandate, however, have also remained relatively low among some analysts for a couple reasons. Firstly, while the TEC is mandated to be an expert body that develops policy and technological advice on issues related to technology development and transfer, interviewees consistently indicated that the body is overly political and suffers from being a veritable extension of the UN climate change talks. This means that the traditional divide between developed and developing countries discussed above plays a dominant role in its deliberations.

The interviews also showed broad agreement that there needs to be a solid and robust link between the Technology Mechanism and UNFCCC financial instruments and institutions. In order to make a difference the CTCN in particular needs larger budgets than it currently can access based on earmarked donations from a limited number of willing developed countries. In addition, in order to utilise climate finance to truly enable an effective and sustainable climate technology transition in developing countries, the Green Climate Fund (GCF) and other institutions need to engage in more than just financing hardware and pay particular attention to supporting activities that will allow domestic capabilities to be built in developing countries. Neither the GCF nor its Board currently seem to consider such aspects, and talks on greater institutional linkage between the TEC, the Global Environment Facility (GEF), and the GCF are an outstanding item on the UNFCCC agenda.

*Feasible options exist to improve the Technology Mechanism, including in the field of research and development cooperation, forming an expert body and a vision for a global network on climate technology capabilities, and providing a strong link between finance and technology in the UN climate talks.*

**Indicators and INDCs on technology**
A small number of interviewees suggested that elements on technology could be usefully included in the INDCs and reflected on what such contributions would look like. Obvious indicators, such as investments in climate technology R&D could be mentioned, or a target for investments could be set in combination with an inspiring innovation target. Moreover, although a step forward, this would still largely ignore functions in innovation systems that go beyond just the need for investment. Would it be possible to include indicators around capability building? Or include a target on a number of international R&D collaborations with research institutions in key sectors in developing countries?

**Key questions to address**
In addition to the clear areas of agreement, a number of open questions emerged, implicitly or explicitly, that could be further considered in the new climate regime. In the first instance the notion of building local capabilities and institutions is an important element if the TM is to effectively fulfil its objectives. But this places a huge burden on the TEC as well as the CTCN, however, as capabilities and institutions will need to reflect the local context. The programmes of the TM that are guided by the TEC and designed and operationalised by the CTCN therefore need to be tailored to the context of individual developing countries. Meeting this challenging task remains a major concern for the TM.

Questions also clearly abound on how to make technology actors think about finance. Much of the discussion to date has focused on quantity of finance rather than the structure of finance. While the former is clearly important, given that there is very limited climate finance available to developing countries – especially smaller countries which are overlooked by the large-scale actors – and specific and riskier technology-related endeavours, the latter does require further attention. Measuring progress on technology raised multiple issues. First, how does one assess the endeavours by various countries in a manner that is comparable, and subsequently, how can an assessment be made in terms of adequacy in relation to meeting the objectives of the UNFCCC. Second, should this assessment be in terms of financial and other resources provided, or should it be in terms of outcomes achieved in terms of reduction of greenhouse gas emissions, establishment of adaptation efforts, or capacity building?

Concerns over the emergence of potentially-disruptive new technologies and industries will need to be addressed. The expansion of China's manufacturing base in clean energy technology – a consequence of careful design and continuous investment in its national innovation system including in innovation capabilities, capable institutions, and R&D – has shown that the current owners of technology will not maintain their first-mover advantage forever and will face competition in innovative technology sooner or later. Policymakers from "Annex I" parties can see this as a threat in the context of wishing to maintain high living standards and continuously generate local jobs. Creating one's own competitors in climate technology areas in which Annex I countries themselves have been investing significant public money to generate much-needed employment could be seen as a barrier to further technology cooperation, in particular, in relation to investment in innovation capabilities in developing countries.

**An agenda for practical action**

The discussion in this article points towards a number of concrete actions relating to technology that potentially could be included in the Paris deal to help its eventual implementation. First, the agreement should welcome and appreciate the constructive role the Technology Mechanism can play, but also reflect that its operations and funding situation needs to be enhanced. Second, the TEC's design needs to help it to develop into a body that assesses options and pathways to enhance technology transfer and gives concrete policy advice; conduct reviews and reality checks of the INDCs from the perspective of technology development and transfer arrangements; provide recommendations of actions that can contribute to the feasibility of INDCs; develop indicators for technology action, measuring progress in low-carbon and adaptation innovation systems in an internationally comparable way, and taking into account the principle of "common but differentiated responsibilities;" identify specific and substantial actions, including international support, for strengthening such innovation systems, and; engage private sector, civil society, and research communities in working groups that lead to widespread, voluntary or eventually enforced, climate-resilience product standards that contribute to mitigation and adaptation.

Third, the CTCN could be requested to develop a practical and ambitious vision and work plan for the Climate Technology Network, with the objective of building innovation and strategic capabilities in all developing economies and particularly in least developed countries (LDCs); develop a programme for R&D collaboration in long-term climate technologies that aims at (tacit) knowledge transfer and cooperation; develop good practices for technology and innovation system operations and governance of national and technology innovation systems. Finally the GCF should be requested to develop, in collaboration with the institutions in the Technology Mechanism, a concrete vision of how its finance efforts are going to contribute towards a transformative change along with the capabilities and institutions needed for that change to occur.

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❶ IPCC, 2000. Methodological and Technological Issues in Technology Transfer. Bert Metz, Ogunlade Davidson, Jan-Willem Martens, Sascha Van Rooijen and Laura Van Wie Mcgrory (Eds.). Cambridge University Press: Cambridge, United Kingdom, pp. 432.